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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/050,169	01/18/2002	Shinichiroh Ikemasu	970607B	9818

38834 7590 06/22/2004

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EXAMINER

WEISS, HOWARD

ART UNIT PAPER NUMBER

2814

DATE MAILED: 06/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/050,169	IKEMASU ET AL.	
	Examiner	Art Unit	
	Howard Weiss	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-108 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-108 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>0304</u> . | 6) <input type="checkbox"/> Other: _____ |

Attorney's Docket Number: 970607B

Filing Date: 1/18/02

Continuing Data: Division of 08/876,908 (6/16/97 now U.S. Patent No. 6,344,692); RCE
established 4/19/04

Claimed Foreign Priority Date: 7/18/96 (JPX)

Applicant(s): Ikemasu et al. (Okawa)

Examiner: Howard Weiss

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/19/04 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
 - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
3. Claims 1 to 3, 8 to 10, 12, 13, 17, 24 to 26, 31 to 33, 38 to 40, 50 to 52, 56 to 60, 64, 65 and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Auer et al. (U.S. Patent No. 5,623,164) and Chung (U.S. Patent No. 5,666,007).

Auer et al. show most aspects of the instant invention (e.g. Figure 1) including:

- a substrate **1**
- a switching or memory cell transistor with an insulated gate **6** and source/drain regions **3,4**

- an insulator laminate including a lower part **15** covering said switching transistor and a higher part **50** having a planarized upper surface over the memory cell transistor
- a first conductive plug **9** formed in a first contact hole and connected to a source/drain region **3**
- a memory cell capacitor with a storage electrode **11**, a capacitor dielectric **47** and an opposing electrode **16** having an extension with is connected to a second conductive plug (not shown) via a second contact hole **18**
- a third conductive plug **8** formed above said lower part and connected to an upper surface of a lower conductive member **4**
- said first contact hole not touching the storage electrode
- contact holes and conductive members (i.e. bit lines) as claimed in a peripheral circuit

Auer et al. do not show the contact hole penetrating through the extension of a opposing electrode, exposing its sidewall of said opposing electrode and electrically connected to said plug (i.e. conductor). Chung teaches (e.g. Figure 10) to form a contact hole **220** to penetrate an extension **211** exposing its sidewalls and establishing an electrical connection to provide enhanced circuit speed without comprising reliability. (Column 4 Lines 25 to 31). It would have been obvious to a person of ordinary skill in the art at the time of invention to form a contact hole to penetrate an extension exposing its sidewalls and establishing an electrical connection as taught by Chung in the device of Auer et al. to provide enhanced circuit speed without comprising reliability.

4. Claims 4 to 7, 11, 14 to 16, 18 to 23, 27 to 30, 34 to 37, 41 to 49, 53 to 55, 61 to 63, 66 to 71 and 73 to 108 are rejected under 35 U.S.C. 103(a) as being unpatentable over Auer et al. and Chung, as applied to Claims 1, 2, 3, 38, 50 and 58 above, and in further view of Ozaki et al. (U.S. Patent No. 5,414,655).

Auer et al. and Chung show most aspects of the instant invention (Paragraph 3) except for the cylinder shape of the storage electrode and for the nitride film covering the claimed features in the memory device. Ozaki et al. teach (e.g. Figures 1 to 22) to make storage electrodes **25** cylindrical in shape and to cover features in a DARM with silicon nitride layers **13,22** to permit easy connection to the substrate while maintaining a large storage capacity (Column 1 Line 66 to Column 2 Line 2). It would have been obvious to a person of ordinary skill in the art at the time of invention to make storage electrodes cylindrical in shape and to cover features in a DARM with silicon nitride layers as taught by Ozaki et al. in the device of Auer et al. and Chung to permit easy connection to the substrate while maintaining a large storage capacity.

Response to Arguments

5. Applicant's arguments with respect to Claims 1 to 108 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Paper copies of cited U.S. patents and U.S. patent application publications will cease to be mailed to applicants with Office actions as of June 2004. Paper copies of foreign patents and non-patent literature will continue to be included with office actions. These cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site (www.uspto.gov), from the Office of Public Records and from commercial sources. Applicants are referred to the Electronic Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197 for information on this policy. Requests to restart a period for response due to a missing U.S. patent or patent application publications will not be granted.

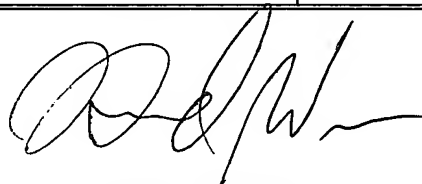
Art Unit: 2814

7. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(703) 872-9306**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(703) 308-4840** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via **Howard.Weiss@uspto.gov**.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group 2800 Receptionist at **(703) 308-0956**.

9. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/ 306, 311, 535	thru 6/17/04
Other Documentation: none	
Electronic Database(s): EAST	thru 6/17/04



Howard Weiss
Examiner
Art Unit 2814

HW/hw
18 June 2004